

Docket No. 030712-29
Application No. 10/811,835
Page 4

IN THE CLAIMS:

Please amend the claims as follows:

1. (Original) A method of designing a circuit layout of a semiconductor integrated circuit, comprising:

designing a logic function of the integrated circuit;

designing a pattern layout of the integrated circuit so that the pattern layout includes a logic cell area and an open area;

inserting a spare underground cell into the open area, wherein the spare underground cell includes a functional element; and

designing a mask layout of the integrated circuit, the mask layout including the logic cell and the spare underground cell.

2. (Currently Amended) [[A]] The method of designing a circuit layout according to claim 1, wherein the functional element ~~includes~~ comprises a D flip-flop, an inverter, a NOR circuit, and NAND circuit, an exclusive OR circuit and a latch circuit.

3. (Currently Amended) [[A]] The method of designing a circuit layout according to claim 1, wherein inserting the spare underground cell ~~includes~~ comprises:

dividing the pattern layout into a plurality of block regions;

searching the open area from the block regions;

distributing the open area into the block regions; and

inserting the spare underground cell into the distributed open area.

4. (Currently Amended) [[A]] The method of designing a circuit layout according to claim 3, wherein the inserting the spare underground cell into the distributed open area ~~includes~~ comprises:

pointing out an open area in an attended block region and an attended spare underground cell;

inserting the attended spare underground cell into the open area in the attended block region;

Docket No. 030712-29
Application No. 10/811,835
Page 5

renewing the attended block region; and
setting a flag when all inserting within the attended block region are finished.

5. (Currently Amended) [[A]] The method of designing a circuit layout according to claim 4, wherein the inserting the spare underground cell into the distributed open are further ~~includes~~ comprises:

renewing the attended spare underground cell; and
repeating the pointing out, the inserting the attended spare underground cell with ~~another~~ another open area in another attended block region and another attended spare underground cell until all of the block regions are finished.

6. (Original) A method of changing a circuit layout of a semiconductor integrated circuit, comprising:

preparing the circuit layout including a logic cell area and a spare underground cell area, wherein the spare underground cell area includes a functional element;
hypothetically disposing a changing layout into the spare underground cell area;
preparing a list of the changing layout;
deciding the position of the changing layout; and
automatically setting a conductive pattern layout of the semiconductor integrated circuit.

7. (Currently Amended) [[A]] The method of changing a circuit layout according to claim 6, wherein the functional element ~~includes~~ comprises a D flip-flop, an inverter, a NOR circuit, a NAND circuit, an exclusive OR circuit and a latch circuit.

8. (Currently Amended) [[A]] The method of changing a circuit layout according to claim 6, wherein the disposing ~~includes~~ comprises:

deleting a logic cell to be changed; and
adding a spare underground cell for replacing the deleted logic cell in the spare underground cell area.

Docket No. 030712-29
Application No. 10/811,835
Page 6

9. (Currently Amended) [[A]] The method of changing a circuit layout according to claim 6, further comprising designing a mask of the semiconductor integrated circuit after the setting.

10. (Original) A method of designing a circuit layout of a semiconductor integrated circuit, comprising:

designing a logic function of the integrated circuit;

designing a pattern layout of the integrated circuit so as to include a plurality of logic cells in a logic cell area and an open area;

inserting a plurality of spare underground cells into the open area, wherein each of the spare underground cells includes a plurality of functional elements; and

designing a mask layout of the integrated circuit, the mask layout including the logic cells and the spare underground cells.

11. (Currently Amended) [[A]] The method of designing a circuit layout according to claim 10, wherein the functional elements includes a D flip-flop, an inverter, a NOR circuit, a NAND circuit, an exclusive OR circuit and a latch circuit.

12. (Currently Amended) [[A]] The method of designing a circuit layout according to claim 10, wherein each of the spare underground cells has a same kind of the functional elements.

13. (Currently Amended) [[A]] The method of designing a circuit layout according to claim 10, wherein inserting the spare underground cells ~~includes~~ comprises:

dividing the pattern layout into a plurality of block regions;

searching the open area from the block regions;

distributing the open area into the block regions; and

inserting the spare underground cells into the distributed open area.

Docket No. 030712-29
Application No. 10/811,835
Page 7

14. (Currently Amended) ~~[[A]]~~ The method of designing a circuit layout according to claim 13, wherein the inserting the spare underground cells into the distributed open area ~~includes~~ comprises:

pointing out an open area in an attended block region and an attended spare underground cell;

inserting the attended spare underground cell into the open area in the attended block region;

renewing the attended block region; and

setting a flag when all inserting within the attended block region are finished.

15. (Currently Amended) ~~[[A]]~~ The method of designing a circuit layout according to claim 14, wherein the inserting the spare underground cells into the distributed open area further ~~includes~~ comprises:

renewing the attended spare underground cell; and

repeating the pointing out, the inserting the attended spare underground cell, renewing the attended block region, setting and renewing the attended spare underground cell with ~~another~~ another open area in another attended block region and another attended spare underground cell until all of the block regions are finished.